Business Client

E-Family Re-Image “How-To” Guide

Revision 2.0

A00

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Contents

1 Overview

The purpose of this document is to detail the required steps for reimaging Dell E-Family notebooks with Microsoft Operating Systems. Dell Mobile Precision Workstations also support Red Hat Linux 5.1. This document is specific to Microsoft OS's

Dell E-Family systems ship with MS Windows XP SP3 (SP2 for XP 32-Bit), Vista SP2, or Windows 7. These images include the Dell recommended software stack and settings, drivers, and applications which are tested and validated with the system

Drivers and applications must be installed on Dell E-Family systems in a prescribed order to ensure optimal performance. Failure to install drivers and applications as detailed in this document may result in undesirable performance

Dell provides drivers and applications that are not included in Microsoft Operating Systems. These drivers are required to enable the new technologies and features of Dell E-Family products. Reinstalled images should be built from a clean OS load and following the steps in this guide. Dell does not recommend starting from an image built for D-Family products or other computer systems

Dell recommends checking BIOS settings (including SATA configurations modes) and updating device drivers and applications when imaging their systems

This "How-To" guide applies to the following E-Family systems:

	1st generation	2nd Generation
Dell Latitude	E4200	-
	E4300	-
	E5400	-
	E5500	-
	E6400	E6410
	E6400 ATG	E6410 ATG
	E6500	E6510
Dell Precision Mobile WorkStations	M2400	-
	M4400	M4500
	M6400	M6500

2 "How-To"

2.1 Supported Operating Systems

The following Microsoft operating systems have been validated for use on Dell E-Family notebook computers:

- Microsoft Windows XP 32 & 64-Bit
- Vista 32 & 64-Bit
- Windows 7 32 & 64-Bit

2.2 E-Family New Features & Image Impact

Dell E-Family systems feature new hardware technologies which require a new software stack, drivers, and / or applications. These products are not compatible with previous images built or installed on non E-Family or previous Dell products. Images between E-Family 1st and 2nd generations are also not compatible

Among these new hardware and technologies are:

2.2.1 New Features Offered on E-Family (all generations):

- Chipset
  - Intel Core 2 Duo & Solo & Celeron M – E-Family 1st generation
  - Intel Core i5 & i7 – E-Family 2nd generation
- Intel RAID Functionality
- eSATA
- Intel Turbo Boost
- Intel AMT (Intel Active Management Technology)
- Graphics controller (Intel, nVidia and AMD)
- HDMI Audio
- Display Port
- Network LoM (Intel and Broadcom)
- Wireless LAN
- Wireless WAN
- WiMAX
- Bluetooth / UWB
- Broadcom Unified Security Hub (USH)
- Contactless smartcard / RFID
- Webcam
- USB 3.0 (*Only M6500)*
- Free Fall Sensor on the mother board
- Dell Control Point
  - System Manager
  - Connection Manager – *applies to E-Family 1st generation only*
  - Security Manager
- Privacy Panel
- Touch Screen Digitizer *(Only E6400 ATG / E6410 ATG)*
- Latitude On / Precision On - Reader, Flash, and ARM

2.2.2 New Features Specific to E-Family 2nd Generation

- New BIOS architecture
- Chipset
  - Core i5 & i7 i5 Dual Core CPUs that include updated integrated graphics
  - Core i7 Quad Core CPUs supporting 1333MHz memory
- Intel Turbo Boost
- Intel vPro (AMT 6.0)
- DDR3 Memory
- Noise Cancelling Digital Array Mics and Light Sensitive Webcam for VOIP and Video Conferencing
- Multi-touch Touchpad
- USB 3.0
- Free Fall Sensor on the motherboard
- Connection Manager removed from DCP
- Latitude On / Precision On – Reader and Flash
- Dell Backup & Recovery Manager
- Dell Manageability Package

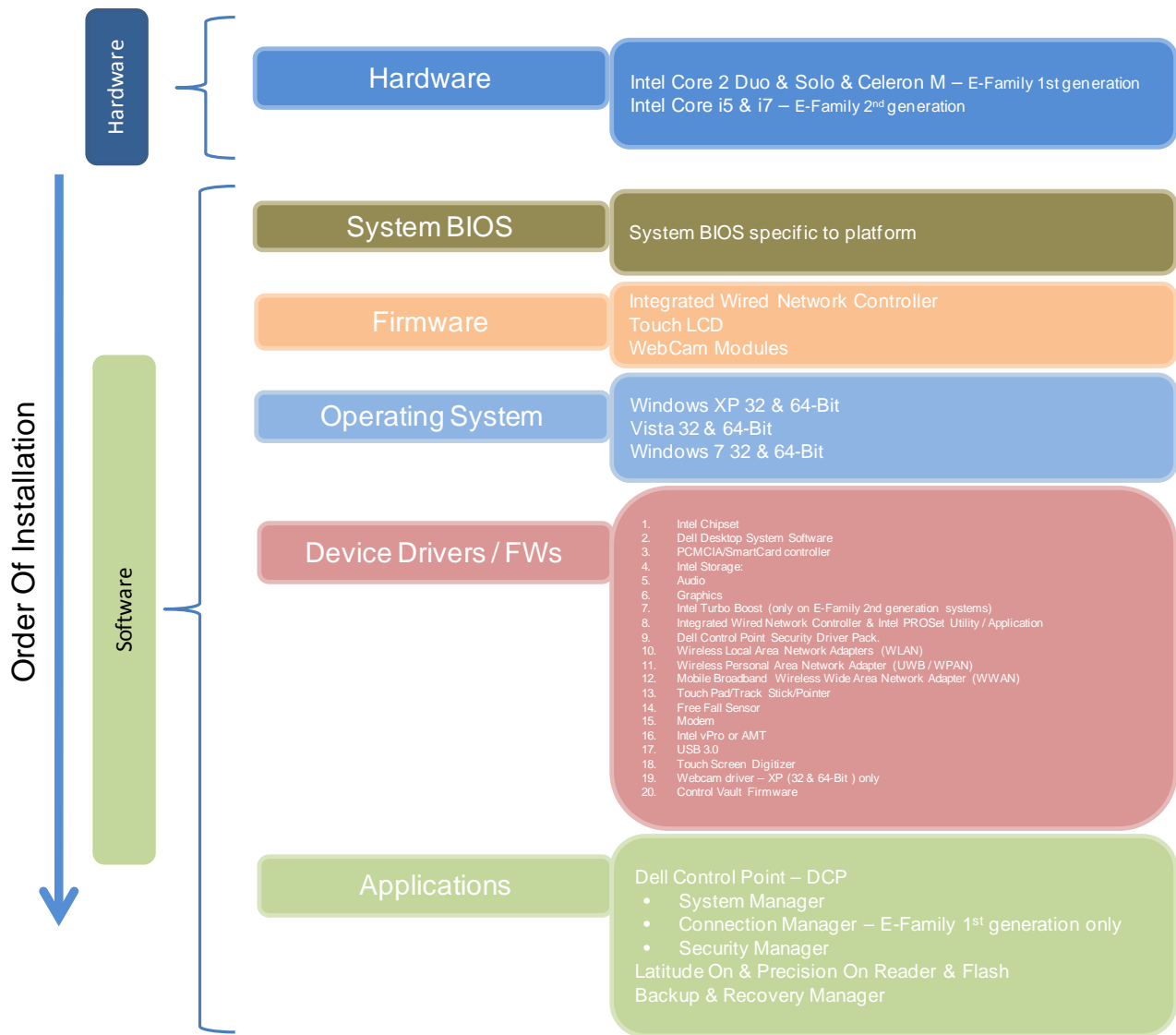
2.3 Latest Drivers / Applications and Utilities

Dell recommends always obtaining the latest and most updated BIOS, drivers, firmware, and applications. Dell validated and tested drivers and applications are located on Dell's support web site http://support.dell.com/

- Choose drivers and downloads
- Select Product Model and the Model Number
- Select Operating System (32-Bit or 64-Bit version must be selected)

2.4 Installation Sequence

The list below is a general overview of drivers and applications that must be installed on Dell E-Family systems in a prescribed order to ensure optimal performance. Actual system configurations may vary

2.4.1 Installation Sequence Overview

2.4.2 Installation Sequence & Features at a Glance:

2.4.2.1 BIOS, Drivers and Firmware:

- BIOS
- Intel Chipset - Helps Windows control system board components and controllers.
- Dell Desktop System Software - A compilation of critical Microsoft QFEs updates
- PCMCIA / SmartCard controller - Enables and enhances the PCMCIA / SmartCard controller
- Intel Storage:
  - Intel Matrix Storage Manager – E-Family 1st generation
  - Intel Rapid Storage Technology – E-Family 2nd generation
- Audio - Enables and enhances the audio controller
- Graphics:
  - Enhances and optimizes video performance
  - Enables & provides additional functionality that are not included in MS native VGA driver
    - User customizable Power Management features
    - Portability & behavioral profiles
    - Multiple monitor support
- Intel Turbo Boost (only on E-Family 2nd generation systems)
  - A driver-based power management mechanism for Intel i3, i5 and i7processors
  - Intelligent power sharing across cores
  - Budgets power limits available to Processor or graphics turbo Processor
- Integrated Wired Network Controller & Intel PROSet Utility / Application - Enables and enhances the network controller
- Control Point Security Driver pack
  - Installs and enables the security devices & controllers
  - Even if you do not install the Control Point managers you should install the Control Point security driver as it contains needed drivers
- Networking & Communication
  - Wireless Local Area Network Adapters (WLAN) - Enables and enhances the Wireless LAN network adapter
  - Wireless Personal Area Network Adapter (UWB / WPAN) - Enables and enhances the UWB or Bluetooth Adapter
  - Mobile Broadband Wireless Wide Area Network Adapter (WWAN) - Enables and enhances the Broadband wireless Adapter
- Touch Pad / Track Stick / Pointer - Enhances the pointing device features
- Free Fall Sensor
- Modem - Enables and enhances the modem
- Intel vPro or AMT – Enhances System Manageability
  - HW based solution using out-of-band communication for management access to client systems (independent of the system state)

- USB 3.0
- Touch Screen Digitizer
- Webcam driver – XP (32 & 64-Bit) only
- Control Vault Firmware Update

2.4.2.2 Applications:

- Dell Control Point:
    - Control Point System Manager
        - DCP All Day Battery Life – ADBL
            - Requires Dell DCP System Manager (***for all System Manager release***)
            - Requires Security driver (***for System Manager version 1.0 & 1.1 only***)
        - DCP – Ambient Light Sensor
            - Requires Dell DCP-SM or ALS utility in case DCP-SM is not desired and under Microsoft Windows Vista only
    - Control Point Connection Manager – E-Family 1st generation
    - Control Point Security Manager (Requires Dell Control Point security driver pack)

- Latitude On / Precision On – Reader, Flash, and ARM
    - Communication solution that is designed to provide quick access to business critical data

- Backup & Recovery Manager

2.5 BIOS

Dell recommends flashing the latest BIOS available to the system. This is posted on Dell's driver & downloads support web site (support.dell.com) under the "BIOS" section

Some of the BIOS settings are critical to Operating System performance. These are as follows:

Settings → System Configuration →SATA Operation

- Disabled: SATA Controllers are hidden
- ATA = Basic Disk Operation mode, does not require additional storage driver. Note: eSATA is not functional in this mode
- AHCI = SATA is configured for AHCI mode (Advanced Disk Operation mode) which offers faster performance, eSATA support, and increased battery life. This mode requires an additional storage driver provided by Dell
- IRRT / RAID On = SATA is configured to support IRRT (Intel's Rapid Recovery Technology). This mode supports AHCI mode features as well as disk mirroring (RAID-1). IRRT allows data backup and restoration. This mode requires an additional storage driver provided by Dell
- RAID = SATA is configured to support RAID. This mode supports AHCI mode features as well as disk mirroring (RAID-1). RAID allows data backup and restoration. This mode requires an additional storage driver provided by Dell
    - *Notes:*
        - *RAID support requires second hard disk drive.*

- If AHCI, IRRT, RAID On, or RAID modes are selected, Intel's Matrix Storage Manager / Intel Rapid Storage Technology driver must be installed in conjunction with the installation of the Operating System. See section "2.6.4 Intel Storage" of this document

TPM Security:

These options enable and configure the Trusted Platform Module (TPM). If TPM is to be deployed, TPM must be enabled in the BIOS Setup program

- Security → TPM Security
  - TPM Security:
    - Disabled ***(Default)***: The BIOS will not turn on the TPM during POST. The TPM will be non-functional and invisible to the Operating System
    - Enabled: The BIOS will turn the TPM during POST so that it can be used by the Operating System
  - Deactivate ***(Default)*** = The TPM will be deactivated
  - Activate = The TPM will be enabled and activated
  - Clear = The BIOS clears the information stored in the TPM

2.6 Recommended Drivers / Applications Installation Order

For best results, Dell recommends installing drivers / applications in the following order:

2.6.1 Intel Mobile Chipset

- Microsoft Operating Systems might not include the updated Intel Chipset Mobile driver for Dell E-Family notebooks. The Intel Mobile Chipset driver is available on Dell's driver & downloads support web site (support.dell.com) under the "Chipset" section

2.6.2 Dell System Software for critical Microsoft QFEs

- Dell recommends installing all of the latest available fixes specific to the system. These are available through the Dell System Software utility posted on Dell's driver & downloads support web site (support.dell.com) under the "System Utilities" section

2.6.3 PCMCIA / Smartcard Controller

- Microsoft Operating Systems do not include the Smartcard controller driver. Install the following driver provided by Dell:
  - R5C8xx Ricoh driver is available on Dell's driver & downloads support web site (support.dell.com) found under the "Chipset" section
  - PCI8412 TI driver (Applies only for M6500) is available on Dell's driver & downloads support web site (support.dell.com) found under the "Chipset" section

2.6.4 Intel Storage - Intel Matrix Storage Manager / Intel Rapid Storage Technology

- The Intel Matrix Storage Manager (IMSM) driver on E-Family 1st generation or Intel Rapid Storage Technology (IRST) driver on E-Family 2nd generation is required to be installed on Operating Systems in AHCI, IRRT, RAID On, and RAID SATA modes

- The Intel IMSM or IRST application must also be installed

- The SATA operation modes are configured in the BIOS. Refer to the BIOS section 2.5

- If the SATA mode is configured in AHCI, IRRT, RAID On, or RAID mode, the IMSM / IRST driver must be installed during the initial Operating System installation stages. The IMSM / IRST driver is only available from Dell

- If SATA configuration mode in the BIOS is set to either AHCI, IRRT, RAID On, or RAID, install the Dell IMSM / IRST driver and application available on Dell's driver & downloads support web site (support.dell.com) under the "SATA Drivers" section

- Follow these steps to install the IMSM / IRST driver:
    - **For Microsoft XP 32 & 64-Bit Operating Systems:**
        - **Installing the Intel IMSM driver using the Floppy Drive**
            - Boot to the Dell Recovery DVD (RDVD) and select the Create RAID driver from the list of items. You will need Floppy Disk Drive and a diskette for this selection. The IMSM / IRST driver must be on the root of the A:\

              Note: the latest IMSM / IRST driver can also be obtained from support.dell.com under the "SATA Drivers" section

            - Once the driver is extracted and stored on the target diskette, boot to the operating system CD and start the installation
            - In the initial stage of Windows Setup, press <F6> to install the third-party IMSM SCSI or RAID drivers
            - When prompted, insert the floppy disk containing the IMSM driver and follow the instructions provided by Windows Setup
            - After reading the floppy disk, either choose "Intel(R) ICH9M-E/M SATA AHCI Controller" if in AHCI mode or "Intel(R) ICH8M-E/ICH9M-eSATA RAID Controller" if in IRRT mode – select the appropriate driver to install
    - **For Microsoft Vista / Windows 7 (32 & 64-Bit) Operating Systems:**
        - **Installing the Intel IMSM / IRST driver after the installation of the Operating System**
            - Boot to the Operating System DVD and start the installation
            - After completing the OS installation, insert the Dell RDVD
            - Select the IMSM / IRST driver and follow the installation procedure

              Note: the latest IMSM / IRST driver can also be obtained from support.dell.com under the "SATA Drivers" section
- If Intel Rapid Recovery or RAID Technologies is to be used, ensure the following:
    - SATA operation mode in the BIOS is set to the appropriate IRRT, RAID On, or RAID mode
    - Microsoft Operating System was installed under IRRT, RAID On, or RAID mode and the latest Intel Storage IMSM / IRST driver is installed
    - Install the following Intel IMSM application provided by Dell:
        - Intel Matrix Storage Manager Application, or
        - Intel Rapid Storage Technology Application

2.6.5 Audio:

- Under XP 32-Bit only with service packs earlier than Service pack-3 and for E-Family 1st generation only, the Audio driver must be installed prior to installing the graphics driver. This applies to Intel graphics solution only

- Microsoft Operating Systems do not include the Audio driver recommended by Dell. The IDT 92HDxxx HD Audio driver is available on Dell's driver & downloads support web site (support.dell.com) under the "Audio" section

2.6.6 Graphics:

- Under XP 32-Bit only with service packs earlier than Service pack-3 and for E-Family 1st generation only, the Audio driver must be installed prior to installing the graphics driver. This applies to Intel graphics solution only. Please refer to the section 2.6.5 Audio in this document

- Microsoft Operating Systems include the VGA graphics drivers only. Therefore for optimum graphics performance, Dell recommends installing the Dell graphics driver applicable to their system available on Dell's driver & downloads support web site (support.dell.com) under the "Video" section

- The following table lists the various graphics solutions' offerings on Dell E-Family products:

		1st Generation										2nd Generation				
		E4200	E4300	E5400	E5500	E6400	E6400 ATG	E6500	M2400	M4400	M6400	E6410	E6410 ATG	E6510	M4500	M6500
Intel	GM45/GE45/GS 45	x	x	x	x	x	x	x								
	QM57/QS57											x	x	x	x	
nVidia	Quadro NVS 160M			x		x		x	x	x						
	Quadro FX 2700M / 3700M										x					
	Quadro NVS 3100M											x		x		
	Quadro FX 880M & 1800M														x	
	Quadro FX 2800M / 3800M															x
AMD	ATI FirePro M7740										x					x

2.6.7 Intel Turbo Boost Driver

- Intel Turbo Boost driver is required to be installed on platforms meeting both of following criteria:
  - nVidia or ATI discrete graphics cards
  - Core i7 and i5 Dual Core CPUs
- Microsoft Operating Systems do not include the Intel Dual-Core Turbo Boost driver. Install the following driver provided by Dell:
  - Dual-Core Turbo Boost driver is available on Dell's driver & downloads support web site (support.dell.com) found under the "Chipset" section

2.6.8 Integrated Wired Network Controller (Ethernet)

- **Broadcom** (***E5400, E5500 and M6400 / M6500 Products Only***)
  - Microsoft Operating Systems XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit either do not provide native support or do not include the driver recommended by Dell. Install the following Dell driver for network connectivity:
    - Broadcom 57XX Gigabit Integrated Controller driver is available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section

- **Intel** (***E4200, E4300, E6400/E6410, E6500/E6510 & M2400 & M4400/M4500 Products Only***)
  - Microsoft Operating Systems XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit either do not provide native support or do not include the driver recommended by Dell. Install the following Dell driver for network connectivity:
    - Intel 825xx Gigabit Platform LAN Network device is available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section
  - To ensure full functionality of the Intel Gigabit Network adapter, Dell recommends that you install the Intel PROSet available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section

2.6.9 Control Point Security Device Driver

- Microsoft Operating System does not have the desired drivers and applications necessary for the security functions offered on E-Family

- The driver will install the device driver for the security devices installed in the Dell E-Family notebook computer. In addition, it will install Microsoft Net framework 2.0 SP1 and any relevant Microsoft QFEs required allowing these security devices to operate correctly

- The driver supports the following Security devices:
  - Broadcom Trusted Platform Module
  - Atmel Trusted Platform Module
  - STMicroelectronics Trusted Platform Module
  - Winbond Trusted Platform Module
  - O2Micro Smart Card Reader
  - Dell Smart Card Keyboard
  - UPEK TouchChip Fingerprint Reader
  - Authentec Fingerprint Reader
  - Broadcom Unified Security Hub
  - Vista Storage driver Update (for ATAPI.SYS)

- The Control Point Security Device Driver is available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

2.6.10 Control Point System Manager

- Dell Control Point System Manager module is a Dell developed modular application providing a complete set of power management configuring and alerting capabilities:
    - Battery Status
    - Power Scheme and Sleep Mode
    - Display and Devices
    - Keyboard Backlighting and Hotkeys Customization
    - Extended Battery Life / All Day Battery Life

- The Control Point System Manager Application is available on Dell's driver & downloads support web site (support.dell.com) under "Control Point" section

- Refer to Table B1 under Appendix-B for DCP System Manager features

- For All Day Battery Life feature (ADBL), install the Dell Control Point components offered by Dell in addition to the System Manager Module(version 1.2 & 1.3)
    - Control Point System Security Manager driver (*applies to Control Point System Manager 1.0 and 1.1*)
    - Control Point System Manager XML file (*applies to Control Point System Manager 1.0, 1.1, 1.2 and 1.3. Not required for 1.4 and beyond*)

- For Ambient Light Sensor (ALS), install the Dell Ambient Light Sensor Utility component of Control Point in addition to the System Manager Module. This component is applicable to Vista 32 & 64-Bit only, and is not required for XP 32 & 64-Bit and Win7 32 & 64-Bit

> ***Note***: Customers can obtain ALS feature by installing ALS utility in case Control Point System Manager is not desired and under Microsoft Windows Vista only

2.6.11 Control Point Security Manager

- Dell Control Point Security Manager module is a Dell developed modular application providing provides access to authentication, encryption, fingerprint readers, and smartcard technologies:
    - Obtain Security Status
    - Manage Logins and Passwords
    - Manage Data Protection

- Security Software Stack:
    - For these security devices to function and interface on E-Family notebooks, install the appropriate Software stack (Applications and Utilities)

    - The security software stack can be obtained through one of the two options:

- Control Point Security Manager Application which is offered to E-Family Customers through Dell's support website
- Third party security software specific to the customer's environment. Dell does not provide 3rd party security software

- The Control Point System Manager Application is available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

- Refer to Table B2 under Appendix-B for DCP Security Manager features

2.6.12 Control Point Connection Manager (applies to E-Family 1st generation only)

- Dell Control Point Connections Manager module is a Dell developed modular application providing a complete communications management environment:
    - Allows the user to create multiple mobile profile settings
    - Ability to create, export, and import user defined usage profiles
    - System custom configuration
    - Execute comprehensive diagnostics and troubleshooting
    - Provides the capability to enable or disable any of the radios on the notebook such as Wi-Fi, Bluetooth GPS, UWB, and mobile broadband

- The Control Point Connection Manager Application is available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

- Refer to Table B3 under Appendix-B for DCP Security Manager features

2.6.13 Wireless Local Network Adapters (WLAN)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit and Win7 32 & 64-Bit Operating Systems do not provide native device driver support for WLAN controllers featured in Dell E-Family systems. To obtain wireless network functionality, install the Wireless LAN device driver applicable to the WLAN devices installed in the notebook computer found under the "Network" section posted on Dell's driver & downloads support web site (support.dell.com). The installer also provides WLAN application support which provides additional features including enterprise authentication enhancements
    - Intel(R) WiFi Link 5300
    - Intel(R) WiFi Link 5100
    - Intel(R) WiFi Link 5150
    - Intel(R) WiFi Link 6300
    - Intel(R) WiFi Link 6200
    - Intel(R) WiFi Link 6250
    - Dell Wireless WLAN 1397 Half MiniCard (4312bg)
    - Dell Wireless WLAN 1510 Half MiniCard (4322)
    - Dell Wireless WLAN 1520 Half MiniCard

    - Dell Wireless WLAN 1501 Half Mini-Card (4313bgn)

- Microsoft Windows XP 32 & 64-Bit, Windows Vista 32 & 64-Bit, and Windows 7 32 & 64-Bit Operating Systems do not provide native device driver support for WiMAX controllers featured in Dell E-Family systems. To obtain WiMAX functionality, install the WiMAX software applicable to the WiMAX device installed in the notebook computer. This is available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section
    - o Intel(R) WiMAX Link 5150
    - o Intel(R) WiMAX Link 6250

		1st Generation										2nd Generation					DCP Connection Manager			
		E4200	E4300	E5400	E5500	E6400	E6400 ATG	E6500	M2400	M4400	M6400	E6410	E6410 ATG	E6510	M4500	M6500	DCP CM 1.1	DCP CM 1.2	DCP CM 1.3	DCP CM 1.4
WLAN + WiMAX	Dell Wireless 1397	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Dell Wireless 1510	x	x	x	x	x	x	x	x	x	x					x	x	x	x	x
	Dell Wireless 1520											x	x	x	x	x				
	Dell Wireless 1501											x	x	x	x	x				
	Intel 5300	x	x	x	x	x	x	x	x	x	x					x		x	x	x
	Intel 5100	x	x	x	x	x	x	x	x	x	x							x	x	x
	Intel 5150	x	x	x	x	x	x	x	x	x	x									
	Intel 6300											x	x	x	x	x				
	Intel 6200											x	x	x	x	x				
	Intel 6250											x	x	x	x	x				
WPAN	Dell Wireless 365	x	x													x		x	x	x
	Dell Wireless 370			x	x	x	x	x	x	x	x							x	x	x
	Dell Wireless 410					x	x	x	x	x	x									
	Dell Wireless 375											x	x	x	x					
	Dell Wireless 420															x				x
WWAN	Dell Wireless 5720	x	x	x		x	x	x	x	x	x						x	x	x	x
	Dell Wireless 5530	x	x	x		x	x	x	x	x	x						x	x	x	x
	Dell Wireless 5540	x				x		x				x	x	x	x					x
	Dell Wireless 5600	x	x	x		x	x	x	x	x	x					x		x	x	x
	Dell Wireless 5620	x	x	x		x	x	x	x	x	x	x	x	x	x	x				x
DCP CM	DCP CM 1.1	x	x	x	x	x	x	x	x	x	x									
	DCP CM 1.2	x	x	x	x	x	x	x	x	x	x									
	DCP CM 1.3	x	x	x	x	x	x	x	x	x	x					x				
	DCP CM 1.4	x	x	x	x	x	x	x	x	x	x					x				

- Customers choosing to utilize the Dell Wireless (DW) WLAN Card Utility or Intel PROSet / Wireless should not install Control Point Connection Manager. If Control Point

Connection Manager is installed, uninstall the existing Intel PROSet / Wireless or Dell Wireless WLAN entries in Add / Remove Programs (or Programs and Features) before installing this software. Customers may also choose to uninstall Dell Control Point Connection manager or uncheck the Wi-Fi control within Dell Control Point Connection Manager

2.6.14 Wireless Personal Area Network Adapter (UWB / WPAN)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not support the Bluetooth controllers featured on E-Family systems. To obtain Bluetooth or UWB functionality, install the associated Bluetooth or UWB device drivers available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section
    - Dell Wireless 365 Bluetooth Module
    - Dell Wireless 370 Bluetooth Minicard
    - Dell Wireless 410 BT + UWB Minicard
    - Dell Wireless 375 Bluetooth Module
    - Dell Wireless 420 UWB Half Minicard

2.6.15 Mobile Broadband Wireless Wide Area Network Adapter (WWAN)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not provide native support for the broadband Wireless WAN controllers featured in Dell E-Family systems. To obtain broadband functionality, install the Broadband device driver applicable to the wireless WAN devices installed in the system, and to the service carrier you have a contract with available on Dell's driver & downloads support web site (support.dell.com) under the "Communication" section

- The Wireless 5600 EVDO-HSPA module requires the installation of Dell Control Point Connection Manager. Install the driver and FW before installing the Dell Control Point Connection Manager. The latest versions of Dell Control Point Connection Manager (v1.3 and later) provide the WWAN drivers and FW in the Dell Control Point Connection Manager Driver Pack. Earlier versions provide the drivers and FW in one single Dell Control Point Connection Manager installer. The Dell Control Point Connection Manger application and Driver Packs can be found under the "Control Point" section posted on Dell's driver & downloads support web site (support.dell.com). Individual driver and FW releases for the 5600 EVDO-HPSA module can be found under the "Communication" section posted on Dell's driver & downloads support web site (support.dell.com). It is highly recommended to use the Driver Packs to ensure version compatibility

- Dell Wireless 5720 Sprint (EVDO Rev-A) Mini Card
- Dell Wireless 5720 VZW (EVDO Rev-A) Mini Card
- Dell Wireless 5530 HSPA Mini-Card
- Dell Wireless 5540 HSPA Mini-Card
- Dell Wireless 5600 (EVDO-HSPA) Mobile Broadband Mini-Card
- Dell Wireless 5620 EVDO-HSPA Mobile Broadband Mini-Card

2.6.16 Touchpad

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Dell Touchpad drivers

- The Microsoft native OS mouse driver only provides basic point and click functionality. No advanced features are available with the native driver and this may provide a less than optimal user experience

- Dell recommends installing the appropriate Dell Touchpad driver for the following user experience benefits:
  - The driver is tuned to the system characteristics to offer enhanced cursor acceleration and precision
  - The driver provides the core palm rejection features
  - Access to additional features and control setting (varies with system) including:
    - Enhanced scrolling and tapping
    - Touch sensitivity control
    - Multi-Touch Gestures (2nd Generation)
    - Jog Shuttle control (M6400 & M6500)

- Differences between Dell Touchpad devices and drivers:

	1st Generation										2nd Generation				
	E4200	E4300	E5400	E5500	E6400	E6400 ATG	E6500	M2400	M4400	M6400	E6410	E6410 ATG	E6510	M4500	M6500
Dell Touchpad / Pointing Stick	x	x	x	x	x	x	x								
Dell Multi-Touch Touchpad											x	x	x	x	
Dell Jog Shuttle Touchpad										x					
Dell Jog Shuttle Touchpad (Multi-Touch)															x

- Dell Touchpad drivers are different between the 1st and 2nd generation of systems. Drivers from the 1st generation (Dell Touchpad / Pointing Stick) and 2nd generation (Dell Multi-Touch Touchpad) are not compatible. Dell strongly recommends only installing the appropriate driver for the system

- Dell Touchpad drivers are found under the "Input Device Drivers" section posted on Dell's driver & downloads support web site (support.dell.com)

2.6.17 Free Fall Sensor

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Free Fall Sensor driver. Install the following driver provided by Dell:
  - Free Fall Sensor driver found under the "Applications" section posted on Dell's driver & downloads support web site (support.dell.com)

2.6.18 Modem (Not applicable to Dell Precision M6400/6500)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Conexant modem driver. Install the following driver provided by Dell:
  - Conexant D330,HDA,MDC,v.92,modem available on Dell's driver & downloads support web site (support.dell.com) under the "Communication" section

- If Dell Control Point Connection Manager module is installed, the Conexant modem driver does not need to be installed

2.6.19 Intel vPro or AMT (*Applicable ONLY to vPro Configurations*)

- Intel Active Management Technology (Intel AMT) allows users to easily manage networked computers to:
  - Discover computing assets on a network
  - Remotely repair systems even after operating system failures
  - Protect networks from incoming threats while easily keeping software up to date

- Ensure that the following drivers provided by Dell are being installed prior to installing the AMT drivers:
  - Intel Mobile Chipset driver
  - Intel 825xx Gigabit Platform LAN Network Device
  - Intel Wireless WLAN driver for WLAN AMT manageability via Intel WLAN adapter

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the AMT drivers. The AMT drivers are available on Dell's driver & downloads support web site (support.dell.com) under the "Chipset" section
  - For E-Family 1st generation systems
    - Intel AMT HECI
    - Intel AMT SOL/ LMS

  - For E-Family 2nd generation systems:
    - Intel AMT HECI (Unified AMT6 Driver)

2.6.20 USB 3.0 *(M6500 system only)*

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the USB 3.0 driver. Install the NEC USB 3.0 driver available on Dell's driver & downloads support web site (support.dell.com) under the "Chipset" section

2.6.21 Touch Screen Digitizer *(E6400 ATG & E6410 ATG systems only)*

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Digitech digitizer driver and application. Install the Digitech Touchscreen driver and application available on Dell's driver & downloads support web site (support.dell.com) under the "Input Device Drivers" section

2.6.22 Webcam

- The Dell E-Family Webcam driver enables the built-in system digital camera. Install the following driver provided by Dell for Microsoft Windows XP 32 & 64 Bit only:
    - Creative Labs Integrated Webcam driver available on Dell's driver & downloads support web site (support.dell.com) under the "Input Device Drivers" section
    - For video capturing / streaming features, install webcam software available from a variety of third party providers and as freeware

2.6.23 Control Vault Firmware

- Dell recommends updating the Control Vault Firmware available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

2.6.24 Windows Update

- Dell recommends performing Microsoft Windows updates to ensure the latest security, reliability, and compatibility updates are installed. These updates can be downloaded from Windowsupdate.Microsoft.com

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2.6.25 Latitude ON / Precision ON

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Latitude ON / Precision ON driver and application

- The following table lists which products supports the Latitude ON / Precision ON feature

		1st Generation										2nd Generation				
		E4200	E4300	E5400	E5500	E6400	E6400 ATG	E6500	M2400	M4400	M6400	E6410	E6410 ATG	E6510	M4500	M6500
Latitude On Precision On	Latitude / Precision ON Reader	X	X									X	X	X	X	X
	Latitude / Precision ON Flash	X	X									X	X	X	X	
	Latitude ON (ARM)	X	X													

- In order to enable the Latitude ON / Precision ON button to hibernate Windows when switching to Latitude ON / Precision ON modes, Dell recommends installing the appropriate software. In order to determine the appropriate software to install, boot to the system BIOS and check the following:
  - o Under BIOS settings -> system configuration
    - Latitude ON – ARM module is installed:
      - Install the "Control Point Button Service" in Windows available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

        NOTE: If you installed the Dell Control Point Connection Manager, the "Control Point Button Service" is already installed

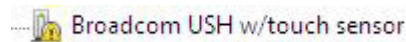
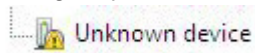
    - Latitude ON Flash / Precision ON Flash – Flash module is installed
      - Install the "Latitude ON Flash" in Windows available on Dell's driver & downloads support web site (support.dell.com) under the "Applications" section

    - Latitude ON Reader / Precision ON Reader
      - Install the "Reader 2.0" in Windows available on Dell's driver & downloads support web site (support.dell.com) under the "Applications" section

Appendix – A, FAQs

1. How do I resolve a PCI Yellow Bang?
    a. After installing the drivers and you have this PCI yellow bang in device manager, you need to install the following drivers found in the Chipset folder:

    b. For E-Family 1st generation you need to install two drivers - AMT SOL / LMS and AMT HECI
    c. For E-Family 2nd generation you need to install one driver - AMT HECI

2. How do I resolve a Broadcom USH Yellow Bang?
    a. After installing the drivers and you have this USH yellow bang in device manager, you need to install the Control Point Security Device Driver Pack

3. How do I resolve this Unknown Device yellow bang on E-Family 2nd generation?
    a. After installing the drivers and you have an unknown device yellow bang in device manager, you need to install the ST Micro Freefall Sensor driver found under Chipset

4. What drivers are in the Control Point Security Device Driver pack?
    a. The driver pack has the drivers for all security related hardware, including:
        - Broadcom Trusted Platform Module
        - Atmel Trusted Platform Module
        - STMicroelectronics Trusted Platform Module
        - Winbond Trusted Platform Module
        - O2Micro Smart Card Reader
        - Dell Smart Card Keyboard
        - UPEK TouchChip Fingerprint Reader
        - Authentec Fingerprint Reader
        - Broadcom Unified Security Hub
        - Vista Storage Driver Update (for ATAPI.SYS)

5. Can I use WiMax and WiFi at the same time?
    a. No, the wireless adapter only supports one of them being active at one time

6. What is the Dell System Software utility and why do I need it?
    a. The Dell System Software utility provides critical updates and patches for your operating system necessary for the correct operation of your system. It is important to install this

utility first after re-imaging your system. It is found under the System Utilities folder on the Dell Drivers and Download page

7. What is the Client System Update application?
    a. Located under System Management > Client System Update, this is primarily targeted at Customers who want to manage systems on their own. The tool is designed to allow users to specify their update preferences and apply updates based on the criticality. Alternatively, end users can use the scheduling option to keep their system up-to-date with the systems software released by Dell

8. What is eSATA?

One of the connectors on the system is a dual eSATA / USB combo port. It can interface with either an eSATA device or a USB device. eSATA is an industry standard interface. A few of the key benefits of eSATA technology are:

- Data speeds up to six times faster than USB 2.0 and IEEE 1394
- Robust and user friendly external connection
- High performance, cost effective expansion storage
- Up to 2 meter shielded cables and connectors

Appendix – B, Tables

- Control Point System Manager Features - Table B1

Category	Feature	DCP SM Release Version	Availablity of Feature when DCP Installed?	Availablity of Feature when Dell provides drivers/middleware, but No DCP	Availabilty of Feature when only Windows OS installed?
Power Manager	user profiles	v1.0	Yes	N/A	Only power schemes are available in the OS.
	View battery manufacturer info.	v1.0	Yes	N/A	Yes, through BIOS
	View battery health info.	v1.0	Yes	N/A	Yes, through BIOS
	battery charge enable/disable status	v1.0	Yes	N/A	Yes
	Network card power management	v1.0	Yes	Yes (Intel LOM)	No (some Broadcom LOMs)
	Extended Battery Life/ All Day Battery Life. (ADBL)	v1.0	Yes	N/A	No
	Dell Enhanced Performance Plans (User Selectable Thermal Tables for Performance, temperature and sound levels)	v1.4	Yes	N/A	No
	Digidesign Audio/Video mode	v1.3	Yes	N/A	Yes, thru individual settings in BIOS/OS
Display settings	Inactivate display and system timeouts when activating an external display using FnF8.	v1.0	Yes	N/A	No
Function Keys	Fn+F2 to enable Battery Charge disable	v1.0	Yes	N/A	Yes, but with No screen pop-up display
	Fn+F3 launch DCP w/ Battery Status	v1.0	Yes	N/A	No
	Fn+F7 to enable/disable DCP	v1.0	Yes	N/A	No
	Fn+F8 to switch between display settings	v1.0	Yes	N/A	Yes, but with No screen pop-up display
Hot Key customizaton	User hot key customization ability (also Fn+D functionality which is set to toggle display by default).	v1.0	Yes	N/A	No
Keyboard backlighting	Keyboard backlighting options (to be able to set the intensity, inactivity timeout values and input triggers.)	v1.0	Yes	N/A	Yes, but with No screen pop-up display
Brightness	Ability to Adjust Brightness Level	v1.0	Yes	N/A	Yes, but with No screen pop-up display
	feedback through on screen display	v1.0	Yes	N/A	No
	Ability to enale/disable ALS	v1.0	Yes	N/A	Yes
ALS	Feedback through on screen display	v1.0	Yes	N/A	No
Hardware Monitoring for Desktops	Reporting of Ambient Temp log information at OS presence (PWS only)	v1.2	Yes	N/A	Through BIOS
	Reporting of CPU Temp log information at OS presence (PWS only)	v1.2	Yes	N/A	Through BIOS
	Reporting of SMART Alerts log information at OS presence (PWS only)	v1.2	Yes	N/A	Through BIOS
	Reporting of ECC Alerts log information at OS presence (PWS only)	v1.2	Yes	N/A	Through BIOS
Privacy Screen - Discreet Graphics	Fn+E to enable/disable Privacy screen	v1.0	Yes	N/A	No
Privacy Screen - UMA Graphics	Fn+E to enable/disable Privacy screen	v1.2.01	Yes	N/A	No
"Color Space" Panel Settings for RGB LED Displays (17" only)	Provides system level controls for NTSC, sRGB, Pro Photo RGB/Kodak or Adobe color settings (certain panels only)	v1.3	Yes	N/A	No

- Control Point Security Manager Features – Table B2

Category	Feature	Release Version	Availablity of Feature when DCP Installed?	Availablity of Feature when Dell provides drivers/middleware, but No DCP App?	Availabilty of Feature when only Windows OS installed?
ControlVault	Secure processing and storage of user security information	v1.0	Yes - USH platforms only	No	No
	Ability to locally backup and restore credentials in CV	v1.4	Yes - USH platforms only	No	No
TPM	TPM enablement and management	v1.0	Yes	Yes - with third party software, including Windows Vista Bitlocker	No for XP Yes, with Windows Vista (driver included) or third party software, including Windows Vista Bitlocker
Pre-Boot Authentication (PBA)	Password and SSO	v1.0	Yes	Password only, no SSO	Password only, no SSO
Embedded Finger Print Reader	Full configuration and management for PBA and Windows Logon	v1.0	Yes	Yes - with 3rd party software, does not include PBA	No
External Dell Branded Finger Print Reader	Full configuration and management for Windows Logon	v1.0	yes (No PBA SUPPORT)	Yes - with 3rd party software, does not include PBA	No
	Full configuration and management for PBA	v1.4	yes (E2 with CV only, no M'09, Foose, Reebok, or Fonseca support)	No	No
Contact Smart Card Reader	Full configuration and management for Windows Logon	v1.0	Yes	Yes - with 3rd party software, does not include PBA	No
	Full configuration and management for PBA	v1.0	Yes	No	No
Contacless Smart Card Reader	Full configuration and management for Windows Logon	v1.0	Yes	Yes - with 3rd party software, does not include PBA	No
Contacless Smart Card Reader	Full configuration and management for PBA	v1.2	Yes	No	No
Full Disked Encrypted Drives (FDE)	Support for 5400 and 7200 FDE's	v1.0	Yes	Yes - with 3rd party software	Yes - with 3rd party software
	Support for SSD FDE's	v1.2.01	Yes	Yes - with 3rd party software	Yes - with 3rd party software
	Support for dual FDE's (non-RAID)	v1.3	Yes	Yes - with 3rd party software	Yes - with 3rd party software
RSA SecurID	RSA SecurID storage in ControlVault	v1.1	Yes - USH platforms only	Yes - USH platforms only	No
Bitlocker (Vista Only)	DCP does not interact with Bitlocker	v1.0	Yes	N/A	Yes

- Control Point Connection Manager Features – Table B3

Category	Feature	Release Version	Availablity of Feature when DCP Installed?	Availablity of Feature when Dell provides drivers/middleware, but No DCP App?	Availabilty of Feature when only Windows OS installed?
WLAN	Dell Wireless LAN 1397, 1510 (Broadcom)	v1.1	Yes	Yes, WITH Dell Wireless Client Utility (DCU)	No for XP Yes for Vista & Win 7, with WLAN AutoConfig, but in box driver has not been Dell validated
	Dell Wireless LAN 1520 (Broadcom TGV - no enterprise extension)	v1.3.01	Yes	Yes, with Dell Wireless Client Utility (DCU)	No for XP Yes - for Vista & Win 7 (with in box drivers) and WLAN AutoConfig
	Intel Wireless LAN 5100, 5300	v1.2	Yes	Yes, with Intel Proset	No for XP Yes for Vista & Win 7, with WLAN AutoConfig, but in box driver has not been Dell validated
	• Intel® Centrino® Ultimate-N 6300 WiFi card • Intel® Centrino® Advanced-N 6200 WiFi card	v1.4	Yes	Yes, with Intel Proset	No for XP Yes for Vista & Win 7, with WLAN AutoConfig, but in box driver has not been Dell validated
	Disconnect on Ethernet WLAN	v1.2	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	No
	View availabe networks & Site Monitors	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	WZC/WLAN AutoConfig for available networks
	WiFi - Catcher	v1.0	Yes	Basic Mode Only	Basic Mode Only
	Hardware Radio Switch	v1.0	Yes	Yes, in BIOS	Yes, in BIOS
	Enterprise Extension for WLAN - 802.1x, WPA-Enterprise/WPA2-Enterprise, CCKM ***(CCX5, TTLS not available for Win 7)***	v1.2	Yes	Yes, wth Intel PROSet or Dell Wireless Client Utility (DCU)	Yes, except CCX and TTLS
WWAN	Dell Wireless Mobile Broadband 5720 Minicard	v1.0	Yes	Yes, with Dell Mobile Broadband Client Utility (DMBCU) for 5720 EVDO (novatel)	No
	Dell Wireless 5600 EV/HSPA (GOBI)	v1.2	Yes	No	No
	Dell Wireless 5530 HSPA Minicard (Helmsley)	v1.0	Yes	No	No
	Dell Wirless 5620 EV/HSPA (GOBI2)	v1.4	Yes	Yes, planned alternative connection manager	No
	Dell Wireless 5540 HSPA Minicard (H2)	v1.4	Yes	Yes, planned alternative connection manager	No
	GPS Novatel/Ericcson	v1.0	Yes	Yes, with Dell Mobile Broadband Client Utility (DMBCU) for 5720 EVDO (novatel) No, for 5530 HSPA (Ericson)	No
	Disconnect on Ethernet WWAN	v1.0	Yes	No	No
	SMS Text Messaging	v1.0	Yes	Yes, with Dell Mobile Broadband Client Utility (DMBCU) for 5720 EVDO (novatel) No, for 5530 HSPA (Ericson)	No
LAN/ Modem/other connections	Broadcom Gigabit LAN	v1.0	Yes	Yes	Yes
	Intel 825X Gigabit	v1.0	Yes	Yes	Yes
	Conexant HAD D330 MDC V.92 modem	v1.0	Yes	Yes	Yes
Location Profiles	Location Profiles	v1.0	Yes	N/A	Yes, limited attributes through Vista and Windows 7 (Network and Sharing Center)
	Import/Export Profiles	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes, limited to WiFi profiles (netsh)
	Profile Management Wizard	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	No
Radio Management	Airplane Mode	v1.0	Yes	No	No
connection/device/status Information	Connection Logs	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	No
	Connection Status	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
	Device Status	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
	Network Status Details	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
	Status Logs	v1.0	Yes	Yes, with Intel Proset or Dell Wireless	No
	Diagnostics Connection base/ Hardware based	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
	Troubleshooting FAQ's/Web links	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
Log-on Features	SSO Pre-logon (Windows XP only)	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes, through GPO (Server 2008)
	VPN Enforcement	v1.0	Yes	Yes, with Dell Mobile Broadband Client Utility 9DMBCU) for 5720 EVDO (novatel) No, for 5530 HSPA (Ericson)	No

Appendix – C, E-Docks

- **Dell E-Docks (E-Family Docking Stations)**

  - Dell E-Family docking stations are architected differently than previous generations of Dell docking stations.
  - To enhance Plug And Play performance E-Family products no longer require a docking profile
  - The following are the list of features and expected behavior differences between D-Docks and E-Docks: